

[0052] WE CLAIM:

1. A processing base unit that interfaces with a fluid-processing cartridge for extracorporeal blood processing, the base unit comprising:

a heat exchange surface; and

a cartridge interface configured to interface with the fluid-processing cartridge so that when the fluid-processing cartridge is installed, the cartridge interface (a) actuates the fluid-processing cartridge such that the fluid-processing cartridge processes a fluid and (b) holds the fluid-processing cartridge in a position that keeps the heat exchange surface in thermal contact with the fluid,

wherein the cartridge interface is configured so that (a) portions of the cartridge interface that drive the fluid-processing cartridge and (b) portions of the cartridge interface that keeps the heat exchange surface in thermal contact with the fluid are both engaged in response to a single operator action.

2. The fluid processing base unit of claim 1, wherein the base unit further comprises a fastening system,

and the single operator action comprises the step of engaging the fastening system.

3. The fluid processing base unit of claim 2, wherein fastening system comprises a lever, and the operator engages the fastening system by moving the lever.

4. The fluid processing base unit of claim 1, wherein the single operator action comprises the step of engaging a fastening system.

5. The fluid processing base unit of claim 1, wherein when the fluid-processing cartridge is installed, heat transfer from the heat exchange surface to the fluid is regulated.

6. A cartridge for processing a fluid comprising:

a thermal-transfer surface that is maintained in thermal contact with the fluid that is being processed; and

at least one control surface {provide AB in spec} that, when driven in an appropriate manner, causes the cartridge to process the fluid,

wherein the cartridge is configured to fit in or on a compatible fluid processing base unit so that the fluid processing base unit can (a) drive the at least

one control surface in the appropriate manner and (b)
transfer heat to the thermal-transfer surface, and

wherein the cartridge is configured so that
a single operator action engages the at least one control
surface and the thermal-transfer surface with corresponding
portions of the fluid processing base unit.

7. The cartridge of claim 6, wherein the single
operator action comprises the step of engaging a fastening
system.

8. The cartridge of claim 6, wherein the
thermal-transfer surface is configured so that when the
cartridge is installed in or on the fluid processing base
unit having a heat exchange surface, the thermal-transfer
surface presses against the heat exchange surface and
conforms to the shape of the heat exchange surface.

9. The cartridge of claim 8, wherein the
thermal-transfer surface is flexible.

10. A fluid processing system comprising:
a base unit;
a cartridge for processing a fluid; and
a fastening system that holds the cartridge
in or on the base unit,

wherein the cartridge includes a thermal-transfer surface that is in thermal contact with the fluid that is being processed, and at least one control surface that, when driven, causes the cartridge to process the fluid,

wherein the base unit includes a heat exchange surface and at least one driver configured so that when the cartridge is held in or on the base unit by the fastening system, (a) the heat exchange surface is kept in thermal contact with the thermal-transfer surface, and (b) the at least one driver can drive the at least one control surface in the appropriate manner, and

wherein the base unit and the cartridge are configured so that fastening system can be fastened by a single operator action that engages the at least one driver with the at least one control surface and also brings the heat exchange surface into thermal contact with the thermal-transfer surface.

11. The fluid processing system of claim 10, wherein heat transfer from the heat exchange surface to the fluid is regulated.

12. The fluid processing system in which the of claim 10, wherein heat transfer from the base unit into the cartridge is relied upon to cool the base unit.

13. The fluid processing system of claim 10, wherein the fastening system is integrated into the base unit, and the single operator action comprises the step of engaging the fastening system.

14. The fluid processing system of claim 10, wherein a first part of the fastening system is integrated into the base unit, and a second part of the fastening system is integrated into the cartridge.

15. An apparatus for processing medical fluids prior to their introduction into a patient's body, the apparatus comprising:

a fluid path, the path having a fluid input and a fluid output, wherein the fluid path is configured so that medical fluid can be introduced into the patient's body via the fluid output; {Spec: there may be intermediate structures.}

a component that performs a function other than heat generation, wherein the component generates heat as a by-product of performing the function;

a thermal path having low thermal resistance that transfers at least some of the heat generated by the component to the fluid path;

a first temperature sensor that senses the temperature of the fluid path (at input or return, or indirect at heat sink)

a heater that is thermally connected to the fluid path via a path with low thermal resistance; and

a control system that activates the heater when the temperature sensed by the first temperature sensor is too low. (spec thermostat on/off, T sensor + variable heat out)

16. The apparatus of claim 15, wherein the thermal path comprises a thermally conductive metal that is formed in a thermally conductive shape.

17. The apparatus of claim 15, wherein the thermal path comprises a fan and at least one heat sink.

18. The apparatus of claim 15, wherein the component is located inside a cabinet, and wherein the apparatus further comprises:

a second temperature sensor that senses the temperature at a location inside the cabinet; and

a cooling system configured to cool the component when the temperature inside the cabinet is set beyond a predetermined level.

19. A method for processing a medical fluid prior to the fluid's introduction into a patient's body, the method comprising:

processing the medical fluid using a mechanism that generates heat as a by-product;

providing a thermal path through which the heat generated in the processing step can flow efficiently into the medical fluid;

heating the medical fluid by allowing the heat generated in the processing step to flow into the medical fluid via the thermal path; and

introducing the medical fluid that was heated in the heating step into the patient's body.

20. The method of claim 19, further comprising the steps of:

sensing the temperature of the medical fluid; and

adding heat to the medical fluid using an auxiliary heater when the temperature sensed in the sensing step is too low.

21. The method of claim 19, further comprising
the steps of:

(a) sensing the temperature in a cabinet
that houses the mechanism; and

(b) cooling the mechanism when the
temperature sensed in step (a) is too high.